

REMARKS

This paper is being provided in response to the Office Action dated September 26, 2007, for the above-referenced application. Applicants respectfully request consideration of the following remarks.

The objection to the summary of the invention is hereby traversed. The Office Action requests a summary that is clearly indicative of "the invention to which the claims are directed," but objects to the summary for tracking the claim language. Applicants submit that the summary, as written, is clearly indicate of the invention to which the claims are directed and, specifically, is "commensurate with the invention as claimed" as required under 37 C.F.R. 1.73. Accordingly, Applicants request that the objection be reconsidered and withdrawn.

The rejection of claims 15-20 under 35 U.S.C. 101 as being non-statutory subject matter is hereby traversed. The Office Action states that "Claim 15 as a whole constitutes merely a software program that is not received as being embodied on a medium that a computer may access to realize functionality of a program." This rejection has been PREVIOUSLY ADDRESSED by amendments to claim 15. Specifically, claim 15 was previously amended to recite computer software stored on a computer-readable medium in accordance with the guidelines on this issue set forth in MPEP 2106(IV)(B)(1); the remaining claims 16-20 depend therefrom. Applicants submit that the claims recite statutory patentable subject matter, it is unclear if this rejection is being asserted without acknowledging the prior amendments that have already been made to address this rejection. Applicants invite the Examiner to contact the undersigned attorney if there is any question as to the prior amendments already made to claim

15 in accordance with the MPEP in response to the previous statement of this rejection. Accordingly, Applicants request that this rejection be reconsidered and withdrawn.

The rejection of claims 1-2, 9-11, 14-17, 20-21, 26, 32 and 34 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 7,047,355 to Nakatani, et al. (hereinafter "Nakatani") is hereby traversed and reconsideration is respectfully requested.

Independent claim 1 recites a method of handling writing new data. The method includes creating a journal entry that points to a first storage location containing old data to be replaced by the data new data. The journal entry is maintained after writing the new data. New storage space is allocated having a second storage location. The new data is written to the new storage space at the second storage location. The old data is maintained in the first storage location after writing the new data to the new storage space at the second storage location. Claims 2-14 depend directly or indirectly from independent claim 1.

Independent claim 15 recites computer software, stored on a computer-readable medium, that handles writing new data. The software includes executable code that creates a journal entry that points to a first storage location containing old data to be replaced by the new data. The journal entry is maintained after writing the new data. Executable code allocates new storage space having a second storage location. Executable code writes the new data to the new storage space at the second storage location. The old data is maintained in the first storage location after writing the new data to the new storage space at the second storage location. Claims 16-20 depend directly or indirectly from independent claim 15.

Independent claim 21 recites a method of restoring data to a storage device. The method includes accessing a journal having a plurality of entries. Each of the entries points to prior data that existed on the storage device before a write caused the entry to be created. There is an entry in the journal for each data write to the storage device that occurred after an initial time. The prior data corresponding to each of the plurality of entries in the journal is maintained in the storage device after each new data write after the initial time. Each of the entries is used to remap the storage device to point to the prior data. Claims 22-27 depend directly or indirectly from independent claim 21.

Independent claim 32 recites a journal used for continuous backup of a storage device. The journal includes a first entry that points to a first storage location containing old data replaced by new data written to the storage device. A plurality of additional entries point to respective additional storage locations containing old data replaced by new data written to the storage device. For every write to the storage device that occurs after an initial time, there is a corresponding entry. The old data corresponding to the first entry and each of the plurality of additional entries is maintained in the storage device after each new write to the storage device after the initial time. Claims 33 and 34 depend directly from independent claim 32.

The Nakatani reference discloses an updated data write method using a journal log. Nakatani discloses that a server, including a buffer memory, and a storage system write journal logs and execute flush processing. Nakatani discloses that a journal log is provided to separately store a file update history in the storage system because the contents of data updating

executed in the buffer memory of the server may be lost because of a failure before data is updated in the storage area in the storage system. (See col. 7, lines 39-45 of Nakatani.) The Office Action cites to col. 6, lines 4-27 of Nakatani in which is disclosed the use of pointers to manage the status of a journal log storing area after flush processing.

Applicants recite a system for managing data writes that include a journal that keeps track of all of the old data storage areas corresponding to each write of new data to a storage device. Applicants refer to FIGS. 5, 6 and 7 of the originally-filed specification in which is shown a series of new writes to a storage device and the corresponding use of journal entries to keep track of the *locations of old data* in the storage device. Accordingly, Applicants' claimed invention provides a method and device for continuous data backup in which a storage device can easily be restored to an earlier state through the use of maintained journal entries and stored old data that is maintained in the storage device. (See, for example, page 14, line 8 to page 15, line 4 of the originally-filed specification.)

The Office Action cites to Figures 4 and 6, col. 8, lines 30-34 and col. 9, lines 61-65 of Nakatani as disclosing "writing the new data to the new storage space at the second location, wherein the old data is maintained in the first storage location after writing the new data to the new storage space at the second storage location." However, these portions of Nakatani disclose allocation of an area of a required size for a journal log area and then incrementing an end pointer in a buffer memory by the size of the allocated area. Nakatani discloses using data in the journal logs to execute flush processing in which updated data is read from the journal log storing area into a cache. (See Col. 5, lines 6-13 of Nakatani). Nakatani specifically discloses

that

When the server 1 receives the flush processing completion notification from the storage system 2, the file system manager 12 dequeues the dirty data, which is stored in the buffer memory of the server 1, from the dirty queue. As a result, the storage area in the buffer memory 13 where the dirty data has been stored is released for use in storing other data. (Col. 5, lines 38-44 of Nakatani)

Thus, Nakatani does not disclose maintaining old data in a first storage location after writing of new data to a new storage space at a second storage location as is claimed by Applicants.

Furthermore, Nakatani 's journal log is disclosed as being provided for new data written to a buffer memory of a storage device before being written to a storage system. Nakatani states:

The journal log is provided to separately store a file update history in the storage system 2 because the contents of data updating executed in the buffer memory 13 of the server 1 may be lost because of a failure before data is updated in the storage area in the storage system 2. *Therefore, the journal log is not necessary once data is updated in the storage area of the storage system 2.* (Col. 7, lines 39-45 of Nakatani.) (emphasis added)

Nakatani discloses a journal log system in which *new updated data* that is to be written to a storage system is first stored in a buffer memory in storage locations that are logged into a journal. That is, the journal log disclosed by Nakatani is for ensuring the correct writing of *new data* to a storage device in the event of a failure before the new data is updated in the storage area.

In addressing Applicants comments from the submitted Statement accompanying Applicants' previously-filed Pre-Appeal Brief Request, the Office Action, at paragraph 23, page 9, asserts that Nakatani teaches updating all items 45 in the journal log, control is passed to step 137 where the journal log controller 34 updated the start-point pointer 43 in the position of the next journal log, citing to Fig. 8, col. 12, lines 14-17 of Naktani, and that this disclosure

anticipates Applicants' claimed invention. Applicants respectfully traverse this conclusion and point out that immediately following the above-noted cited portion, Nakatani goes on to disclose flush processing of the journal log data. (See col. 12, lines 17-47 of Nakatani). As noted above, flush processing releases memory that stores dirty data for use in storing other data. Nakatani specifically discloses processes for "reduc[ing] the time required from the moment the journal log controller 34 receives a flush request to the moment the journal log controller 34 sends a flush processing completion notification to the server 1." (Col. 12, lines 44-47 of Nakatani). Applicants, in particular, note that the above-noted portions of Nakatani concern updating the start-point pointer to the next journal log followed by flush processing of the journal log.

Applicants have pointed out that Nakatani discloses writing updated data of a journal log, that is to be written into a storage device, first into a cache or buffer memory at storage locations that are logged into a journal. Nakatani refers to the process of writing updated data from a journal log into cache memory as "reflecting" the journal into cache memory. (See FIG. 8 and col. 11, lines 59 to col. 12, lines 13 of Nakatani). This is arguably consistent with Nakatani's disclosed purpose of ensuring the correct writing of *new data* to a storage device in the event of a failure before the new data is updated in the storage area. Applicants submit, however, that as set forth above, the writing of updated data from a journal log into the cache memory does not teach or suggest a system that allows for restoring of a storage device to an earlier state by using journal entries to maintain pointers to storage locations of old data that is to be replaced by the writing of new data and in which the old data is maintained in the first storage location after the new data is written to a second storage location, as is claimed by Applicants.

Accordingly, Applicants respectfully submit that the Nakatani does not teach or fairly suggest at least the above-noted features as claimed by Applicants. In view of the above, Applicants respectfully request that the rejection be reconsidered and withdrawn.

The rejection of claims 3-8, 12-13, 18-19, 22-25, 27 and 33 under 35 U.S.C. 103(a) as being unpatentable over Nakatani in view of U.S. Patent No. 7,013,379 to Testardi (hereinafter "Testardi") is hereby traversed and reconsideration is respectfully requested. Once again, Applicants note that some paragraphs set forth in the Office Action appear to refer to a "Sakuraba" reference (paragraphs 15, 16, 17, 18, 19, 21, 22 of the Office Action). It is believed that, where cited in the Office Action, "Sakuraba" is meant to refer to the Nakatani reference, since no other identifying information is provided for the "Sakuraba" reference. However, since Applicants have pointed out this discrepancy multiple times, if the Examiner is intending to cite to a "Sakuraba" reference, Applicants submit that this reference should be identified in the text of the Office Action in a properly articulated rejection and appropriately cited on a PTO 892 form by the Examiner.

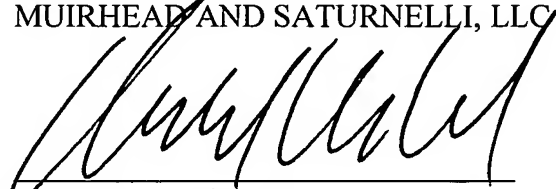
The features of independent claims 1, 15, 21 and 32 are discussed above with respect to Nakatani. Claims 3-8, 12-13, 18-19, 22-25, 27 and 33 depend therefrom.

The Testardi reference discloses techniques in a computer system for handling data operations to storage devices. The Office Action cites to Testardi as disclosing the use of a switch that handles data operations to a storage device.

Applicants respectfully submit that Testardi does not overcome the above-noted deficiencies of the Nakatani reference with respect to Applicants' claimed invention. Accordingly, Applicants submit that neither Nakatani nor Testardi, taken alone or in any combination, teach or fairly suggest at least the above-noted features as claimed by Applicants. In view of the above, Applicants respectfully request that the rejection be reconsidered and withdrawn.

Based on the above, applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 508-898-8603.

Respectfully submitted,
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